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Visualising the Electronic Order of Battle

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The Problem

The Electronic Order of Battle (EOB) details all known combinations of emitters and platforms in a particular Area of Responsibility, for both Blue and Red force data. On today's modern battlefield an EOB can present a very complex and potentially confusing picture to the war fighter. Consequently, some method of presenting the EOB in a format readily assimilated by operators amongst the myriad data presented to them during pre-mission briefings is required. It is believed that visualisation techniques could be used to enhance the presentation of EOBs and assist operators to better understand and retain the data presented.

The PowerPoint presentation comprises two parts: a brief description of how an EOB is produced and then a brief on how EOBs are currently presented.

EOB Production at the CFEWC

The EOB is produced from the Canadian Forces Electronic Warfare Database (CFEWDB) which holds data on emitters, platforms, threat systems, and signatures, amongst other things. When it is decided to deploy assets into a particular theatre of operations a particular Area of Responsibility will be allocated and an EOB generated for that Area of Responsibility.

Data is extracted from the CFEWDB based on various source products linked to the Area of Responsibility of interest and the EOB for that Area of Responsibility. The data thus extracted is used in the programming of mission libraries for the particular EW systems to be deployed into the Area of Responsibility. However, the mission libraries are only as accurate as the available data allows. Therefore, there is the facility to feedback data on emitters encountered in theatre to the mission library production stage for rapid reprogramming of systems, and to the EOB so that it might be updated to reflect the current emitter situation in theatre.

In this way the EOB is continually updated by the original source products and feedback from the Area of Responsibility.

Presenting the EOB

Traditionally, the EOB has been presented to the operator in the form of paper based products, sometimes comprising large volumes of bound reports, and PowerPoint style presentations. This method required the operator to keep notes and rely on marked up maps and their memory to be aware of threats in their Area of Responsibility.

Currently, the EOB can be presented in the form of PDF files and simple electronic maps, which cuts down on the amount of paper involved but is far from an ideal system.

Work is ongoing into adopting interactive desktop GIS and browser based GIS linked to live database feeds, such as the CFEWDB. This approach gives a near real-time picture of the EOB for the Area of Responsibility to the operator.

Superimposing 3-D representations of missile engagement zones onto the GIS picture contributes to understanding the threat scenario because 'no go' areas which the Blue weapons platform should avoid become clearly defined. However, in the case of complex, interlocking and overlapping missile engagement zones it becomes very difficult to distinguish a 'safe passage' through the threat.

Perhaps a future system of presenting the EOB visually will utilise a fully interactive 3-D environment whereby the operator could 'fly' the mission in virtual reality.

Conclusion

The EOB for any particular Area of Responsibility is likely to present a highly complex picture to the operator. Currently, the EOB is presented in the form of paper reports and simple electronic maps, although work is ongoing in using a desktop GIS environment to present the EOB in a more readily assimilated form.

Paradoxically adding 3-D representations of missile engagement zones both enhances and complicates the GIS picture. The problem is how do we present the EOB data to the operator in a meaningful yet readily understandable and retainable form?